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GONOCOCCAL AND SYPHILITIC AFFECTIONS OF THE EYES

Based upon an Address delivered before the Medical Society for the Study of Venereal Diseases on March 27th, 1925, by N. BISHOP HARMAN, M.A., M.B. (Cantab.), F.R.C.S. (Eng.), Senior Ophthalmic Surgeon to the West London Hospital.

By arrangement with my colleague, Mr. Hudson, my share of the opening of this discussion will be mainly confined to the syphilitic affections of the eye. I shall only refer to the gonococcal affections in so far as is necessary to give the relative effects of the two diseases in injury to sight.

The effects of syphilitic affections upon the eye are so varied and extend through such a long period of life that it would be well-nigh impossible to give any satisfactory picture thereof in the brief span of such a discussion as this, unless there were some limitation in the scope of the enquiry. I therefore propose to take as my main thesis—syphilis as a cause of blindness. Loss of sight is to the eye what death is to the body. So the tale of blindness is in effect the “bills of mortality” of the eye. Taking damaged sight as my criterion, I shall be able to show that syphilis is accountable for more blindness than is any other single infection or degeneration of the eyes. The volume of its effects will differ according to the age of the subjects whose condition is under examination; sometimes the volume will be overwhelmingly large, at other times the incidence of other causes of blindness will diminish it relatively, but at no age are the consequences of syphilis small.

The material from which the figures given in this paper is obtained comes from three sources. First, I have the oversight of a well-known home for blind babies. I see these infants before their admission to the home, and at intervals during their stay in the home. Secondly, for the past twenty odd years I have had supervision of several blind schools established by what is without doubt the largest education authority in the world. During those years I have examined the children for whom

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admission to special schools was proposed, and further visited the schools at stated periods and examined the children. Lastly, I have collected from my private case-books a series of records of blindness and partial blindness. The sum total of the cases coming under review is now well over 5,000, quite sufficient to give a fair picture of the causes of blindness in infancy, in childhood, and in adult years.

BLIND INFANTS

Some 200 blind infants have come under examination, mostly about the age of one year. When admitted to the home they remain there until the age of five years, when they are transferred to other blind schools. The causes of blindness in these infants fall into three groups: (1) Surface inflammations; (2) inflammations within the eyeball; (3) congenital defects.

The first of these three groups is the largest and accounts for over half the cases. Ophthalmia neonatorum is the main contributor, for no less than 49·2 per cent. were blinded by this one disease. Purulent conjunctivitis of later months, following streptococcal infections, scarlet fever, diphtheria and measles, accounted for an additional 7·94 per cent. The second group of cases due to inflammation within the eyes showed the effects of irido-cyclitis, uveitis and optic atrophy. These total 11·11 per cent., and, for the most part, the primary cause appeared to be congenital syphilis. The third group, containing 30·14 per cent. of all, was composed of a number of different forms of congenital defect of the eyes, most of them due to undevelopment, or pathological arrest of development. A minority of these were undoubtedly due to a syphilitic inheritance, but in what proportion I was unable to determine, since it was not possible to carry out the blood test seriatim. The conditions amongst these babies showed that at least 60 per cent. of them owed their blindness to venereal disease in the parents, and that 50 per cent. arose from gonorrhœa, and more than 10 per cent. from syphilis.

BLIND SCHOOL CHILDREN

This group of cases constitutes one of the largest returns of an individual enquiry put on record, and it has the advantage that since the returns have been made by

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one observer, and the examination of these several cases have been made on many occasions, there has resulted a uniformity of return and certainty of diagnosis which is rarely obtainable by a single examination or the examination of some other observer's records. The children examined numbered 3,300. The eye conditions of these children have been classified on two occasions, for the Royal Commission on Venereal Diseases in 1913, and again for the Departmental Committee on the Causes and Prevention of Blindness in 1920, so that I am able to give you the relative incidence of blindness from venereal disease on two occasions and each for a period of seven years. For the purpose of this paper, I will take the three groups found amongst the infants: (1) surface inflammation; (2) inflammation within the eyeball; (3) congenital defects.

Whereas in the babies the first of these three groups was the largest, amongst the school-children it fell to the smallest group, the order of the three groups according to volume of cases being first the inflammations within the eye; second, congenital defects; and lastly, surface inflammations. The change in the relative volume of cases in the groups is almost wholly due to the influx of cases showing the effect of congenital syphilis in the children of about seven years of age. The occurrence of interstitial keratitis, iritis, and various other forms of uveitis, resulting in disseminated choroiditis and optic atrophy, swell the number in this group so largely that it overwhelms the dire effects of ophthalmia neonatorum and of congenital defect of the eyes.

In the first of the three groups which we take into account, there were 699 children blinded from the effects of surface inflammation. Ophthalmia neonatorum was responsible for by far the greater number of cases of blindness, and, in particular, cases of total blindness. The number due to this one cause was 369. Purulent conjunctivitis of later years accounted for only 90, and phlyctenular keratitis for 242. In the second group, cases of blindness due to inflammation within the eyeball, there were a great variety of clinical manifestations, but they may be roughly classified as they affected the anterior half of the eyeball and the posterior half; 413 were blinded by inflammations of the front half of the eye; chief amongst these was interstitial keratitis, the

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effects of congenital syphilis ; there were a further 24 probably due to this cause, and 13 due to tubercle. Iritis and irido-cyclitis accounted for 14 ; of these syphilis was responsible for all but two. Inflammation of the posterior half of the eye accounted for 249 cases, the clinical signs were mainly those of disseminated choroiditis ; of the 249 cases, 210 were certainly due to congenital syphilis, with a further 29 probably due to this cause. Congenital defects accounted for 408 cases.

Summing up the general causes of blindness amongst these school-children, we get percentage figures as follows :

Ophthalmia neonatorum	.	.	19·79
Syphilitic inflammations	.	.	31·43
Congenital defects .	.	.	27·13
Miscellaneous	.	.	21·65

Venerereal disease in the parents, therefore, accounted for more than one-half the blindness found amongst school-children, that is, children between the ages of seven and sixteen years.

PATIENTS OF ALL AGES

My third set of cases was collected in ordinary private practice. The desirability of securing some data of blind persons of all ages made me examine 5,000 cases *seriatim*. These persons were of all classes and all ages, and, as may be expected, adults were in the great majority. Amongst these 5,000 there were 925, or about one-fifth of them, blind in one or both eyes, and 603, or one-eighth, blind or partly blind in both eyes. With adult years there are many conditions that come into play in the production of blindness—accidents of war and of civil life, cataract, a whole series of degenerations of the uvea due to vascular diseases, senile changes of the retina and choroid, glaucoma, and the end effects of high myopia—so that our three primary groups of cases are swamped by these additional causes of blindness. But taking only our three groups for the moment—superficial inflammations, inflammations within the eyes, and congenital defects—we find that ophthalmia neonatorum accounted for 17 cases ; there was one only of gonorrhœal ophthalmia in an adult. In the second group there were 5 cases of gonorrhœal iritis, and 89 cases of blindness due to syphilis—keratitis,

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choroiditis, optic atrophy, and tabes—so that gonorrhœa gave a percentage of blindness of 2·49 of the gross total, and syphilis 11·6 per cent. These syphilitic cases form the largest group of preventable disease in this all-age selection of blind persons.

Summing up the findings of these three returns, there is this conclusion: that 50 per cent. of the blindness of infancy is due to the preventable disease ophthalmia neonatorum; that 50 per cent. of blindness in school-children is due to parental venereal disease, of which 20 per cent. is gonorrhœal and 30 per cent. syphilitic; and that in all ages, including both young and the very old, the blindness from venereal disease was about 14 per cent., some 2·5 from gonorrhœa and 11·5 from syphilis.

I now propose to deal with some points that arise from these investigations. They are of much interest.

It may be asked: Is there any evidence of a diminution or increase in the incidence of blindness from venereal disease? Much has been done to reduce the incidence and lessen the effects of ophthalmia neonatorum. Have our efforts been successful in reducing the incidence of blindness therefrom? Much has been done for the cure of syphilis in adults. Has this reduced the effects of the disease in causing blindness, particularly in the second generation?

My returns of blindness in school-children cover a period of fourteen years. At the end of the first seven years my figures were tabulated and returns made for the Royal Commission on Venereal Disease; at the end of the second seven years the figures were again tabulated for presentation to the Departmental Committee on the Causes and Prevention of Blindness. Comparing the returns of these two periods, we get certain valuable findings. To compare the percentage figures of the two periods is not sufficient, though that be of interest. To 1913 ophthalmia neonatorum accounted for 24·16 per cent. of blindness, and to 1920 only 19·79 per cent., so that there was a fall of 4·38 per cent. To 1913 syphilis accounted for 29·70 per cent., whereas to 1920 it was debitable with 31·43 per cent., or a rise of 1·73 per cent. But percentage returns have this defect, that a big fall in one group of cases will mean a rise in all others where the changes are small, and may possibly mask a real decline in incidence.

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It is better to refer these blind returns to the total nominal roll of the school-children for these periods. The number of blind children admitted in the first seven years was 737, and in the second seven years 757, so that there was but little change in numbers. The average nominal roll of all the children in the schools in the particular area was in the first period 731,981, and in the second period 717,665, again very little change. If we relate the cases of blindness due to the causes we are now interested in to this school population, and quote the number of blind per 100,000 of school-children, we get the following :—

BLIND PER 100,000 CHILDREN

Cause of Blindness.	1907-13.	1914-20.
Ophthalmia neonatorum .	18·3	12·5
Congenital syphilis . .	46·8	40·2

This presents a very real indication of a fall in the incidence of blindness from these two great causes, the major causes in school-children—a fall of six per 100,000 in cases due to ophthalmia neonatorum, and four per 100,000 from syphilis. But since the tale of the cases from syphilis is so much higher than that from ophthalmia neonatorum, there is much room for improvement in a further diminution of cases due to syphilis.

CLINICAL SIGNS OF SYPHILIS

In school work the diagnosis of congenital syphilis must rest for the most part upon associated symptoms. The school doctor cannot make a blood test, though he commonly has information regarding this test passed on to him. But there are many other signs available for his assistance. Taking a series of 190 cases of interstitial keratitis due to congenital syphilis, I find recorded the following associated signs: Hutchinsonian teeth, 129; characteristic physiognomy, 73; iritis, 77; disseminated choroiditis (where fundus could be seen), 30; bad family history, 72; evidence of bone or joint disease, 16; ulceration of nose or palate, 9; deafness, 43. Amongst

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a series of cases of syphilitic disseminated choroiditis there were 39 of teeth, 12 of physiognomy, 41 of family history, 8 of bone disease, and 2 of deafness.

It is of some interest to note that the incidence of the characteristic teeth was less in the deeper affection of disseminated choroiditis than in interstitial keratitis. But amongst the sufferers from disseminated choroiditis there were other and more serious symptoms ; of 51 such cases, 22 became insane, 18 were mentally deficient, 2 microcephalic idiots, and 9 epileptic. That tale sufficiently indicates the serious mental dullness which marks the children who show the effects of syphilis in the deeper vascular tissues. They are amongst the poorest material of the blind schools, and the instability of their general health makes it dangerous to attempt anything like the full educational methods that are properly applicable to children who are, as it were, accidentally blinded, like the sufferers from ophthalmia neonatorum.

BAD FAMILY HISTORY

The family history of the children blinded from syphilis is often most illuminative. The mothers give a history of early miscarriages, then still-born children, followed by diseased children, and finally some apparently healthy children. I had the curiosity to collate the histories of a series from my records. These number 150. To give some sort of control of the findings, I took similar histories of 150 women who were patients at my hospital ; in these latter there was no selection of cases ; only those with a known syphilitic affection were eliminated.

The 150 syphilitic mothers had 1,001 pregnancies, with from 1 to 18 pregnancies for a mother. These 1,001 pregnancies produced 290 healthy children according to report (and included with these are all who died over the age of three years of disease not certainly syphilitic), 92 miscarriages, 80 still-births, 229 infant deaths, and 210 diseased, *i.e.*, certainly syphilitic, children.

The 150 non-syphilitic mothers had 826 pregnancies, with from 1 to 17 for a mother. These 826 pregnancies produced 654 healthy children, 61 miscarriages, 17 still-births, and 94 cases of infant death.

We can judge the differences if we set the two returns against each other calculated per 1,000 pregnancies.

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	" Healthy " children.	Mis- carriages.	Still-born.	Infant Deaths.	Diseased with Syphilis.
Syphilitic .	399	92	80	229	210
" Average " .	791·7	73·8	20·5	113·8	—

Remark may be made on the fact that the syphilitic mothers had about 17 per cent. more pregnancies than the " average " mothers. This is probably accounted for by the frequency of miscarriages in the syphilitic, and the short intervals between them allowing for several pregnancies within the same time taken by one healthy pregnancy.

The tale of misery and ill-health, in both children and mothers, which these returns demonstrate make the reduction of syphilis in the parents imperative. It is the only mean whereby we can certainly diminish the incidence of blindness and child disease. The same is true of ophthalmia neonatorum. We have now got such a reduction in the incidence of this disease, that it is probable that the low incidence can be reduced but little more despite the most careful prophylaxis and the most expert treatment of such cases as do occur. Further, reduction of the incidence of blindness from ophthalmia neonatorum can be obtained with certainty only by the cure of the affected mothers before parturition. This was known to Gibson, of Manchester, in 1807, who was the first to recognise the essential features of the disease, and who wrote, " the leucorrhœa of the mother ought, if possible, to be cured during pregnancy." If this be true of gonorrhœal affections, it is still more true of syphilitic affections transmitted to children. The symptoms of congenital syphilis are refractory to treatment to the last degree. Therein they differ widely from the symptoms following acquired syphilis, which readily submit to treatment with the exception of the end affections where the nervous system is attacked. The conditions that occur in children are as refractory to our best methods of treatment, so far as checking their progress before sight is damaged, as are tabes dorsalis and other nerve lesions. Such experiences as these make us, who find our sphere

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in eye work, look to you, who devote your energies to the treatment of venereal disease, for a reduction of our worst cases, those that cause the miseries of life-long blindness. The stoppage of these cases at their source is within your hands. Make your propaganda so effective that no infected person will dream of failing to secure treatment immediately after infection, or of ceasing to attend for effective treatment until he or she is assured that there is a reasonable certainty that a cure has been obtained, or of failing to return for a safeguarding course of treatment before marriage, and possibly (where parents have been infected) for the mothers during gestation. If you can and will secure these measures, then we eye surgeons will be bereft of a large part of our work, and a part which is confessedly of ever-varying interest. But, unlike the masters of the bewitched slave girl cured of her sorcery by the Christian missionary, Paul, we shall not cry out "the hope of our gain is gone," but rather rejoice, for there is better eye work to be done amongst the healthy than amongst the diseased and degenerate.